INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/15816

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07B53/00 C07B57/00 C07F7/18 C07D307/28 C07D309/18
C07F11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	O. FUJIMURA: "Asymmetric ring-closing metathesis catalyzed by chiral molybdenum alkylidene complexes" JOURNAL OF ORGANIC CHEMISTRY, vol. 63, no. 3, 6 February 1998 (1998-02-06), pages 824-832, XP002102158 EASTON US page 826, column 1; page 828, column 2 --- -/--	1-7, 12-14, 34, 56-60, 74-76

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 November 1999	19/11/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Wright, M

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J. B. ALEXANDER: "Catalytic enantioselective ring-closing metathesis by a chiral biphen-Mo complex" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 120, no. 16, 29 April 1998 (1998-04-29), pages 4041-4042, XP002102157 DC US the whole document	77-79, 84-86
X	O. FUJIMURA: "Asymmetric ring-closing metathesis: kinetic resolution catalyzed by a chiral molybdenum alkylidene complex" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 118, no. 10, 1996, pages 2499-2500, XP002102152 DC US the whole document	77-79,84
X	L. E. MARTINEZ: "Highly enantioselective ring opening of epoxides catalyzed by (salen)Cr(III) complexes" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 117, no. 21, 31 May 1995 (1995-05-31), pages 5897-5898, XP000569876 DC US table 3	61,62, 67-72
E	WO 99 42469 A (MIT) 26 August 1999 (1999-08-26) claims; examples	77-79, 84-86
P,X	D. S. LA: "Mo-catalyzed asymmetric synthesis of dihydrofurans. Catalytic kinetic resolution and enantioselective desymmetrization through ring-closing metathesis" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 120, no. 37, 23 September 1998 (1998-09-23), pages 9720-9721, XP002102156 DC US the whole document	1-10, 15-20, 34, 40-45, 56-65, 67-72, 74-79, 84-86

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: not applicable
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: not applicable

Present claims 61-63 and 67-75 relate to methods defined by reference to a desirable characteristic or property, namely the products obtained by the methods lack a plane of symmetry.

The claims cover all methods having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such methods. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the methods by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the methods involving enantioselective olefin metathesis reactions.

In view of the extremely broad claims, the search was executed with due regard to the PCT search Guidelines (PCT/GL/2, C-III, paragraph 2.1, 2.3 read in conjunction with 3.7) and Rule 33.3 PCT, i.e. the international search was executed with particular emphasis on the inventive concept, represented by the following subject-matter: enantioselective olefin metathesis reactions, and, insofar as possible and reasonable was complete in that the entire subject-matter to which the claims are directed has been taken into account.

INTERNATIONAL SEARCH REPORT

information on patent family members

Inter[redacted]nal Application No
PCT/US 99/15816

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9942469 A	26-08-1999	NONE	